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The European Credit Market and Institutions

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The European Credit Market and Institutions

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Abstract

This paper uses polled panel OLS robust estimations with quarterly data for 26 EU countries from the 1980s until 2006, comparing the results of three panels of countries during different time periods. The results obtained confirm the high degree of integration among the EU financial systems and demonstrate not only the quite high degree of openness of the financial markets, but also their indebtedness and the dependence of the EU banking institutions on the financial resources of other countries.

JEL Classification: E4, E5, G2.

Keywords: European credit market; European bank institutions; financial integration; panel estimates.

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The European Credit Market and Institutions

1. Introduction

It has recently become very clear to what extent well-developed and accessible credit markets and institutions may be an important condition to economic growth. Banks and other financial institutions are supposed to guarantee the financing of productive investments and activities, as they mobilise and allocate financial resources and also by their specific money-creation processes through bank credit.

At the same time, well-functioning markets and financial institutions may decrease the transaction costs and asymmetric information problems. They also play an increasingly important role in identifying investment opportunities, selecting the most profitable projects, mobilising savings, facilitating trading and by the diversification of risk, as well as improving corporate governance mechanisms. More efficient credit sectors may also represent a necessary and important condition for the transmission mechanism of monetary policy.

During recent decades, the European credit market and institutions have had to embrace very deep structural changes. The European Economic Community (EEC) of ten rich member-countries at the beginning of the 1980s has grown into today's enlarged European Union (EU) of 27 rich, less rich and even quite poor European countries. Furthermore, the introduction of the single currency accelerated the process of consolidation and financial integration, not only in the European Monetary Union (EMU) countries, but in the EU as a whole, in which the twelve newest member-states also have a voice, in spite of the possibly heterogeneous nature of their financial systems.

Thus, the process of financial integration is, on one hand, a necessary pre-requisite for the adoption of the single currency and the implementation of the single monetary policy, with the predominance of the banking intermediation in the context of the EU. On the other hand, this process raises the potential

to incite liquidity crises, such as the one that we currently face. Crises of such a nature are contagious and affect the increasingly integrated European financial system.

The introduction of the EMU increased competition and reduced some of the competitive advantages of local and national banks, which were based on factors such as currency risk, a lack of price transparency and a better knowledge of national monetary policy.

The European credit markets have also faced some common trends in the context of the pressures exerted by globalisation, which include the process of disintermediation, the adoption of new technologies, the deregulation of financial services and in particular, the increased competition in all segments of the financial product market and banking services.

Despite all the changes and disintermediation, the asset structure of EU banks reflects the rapid increase in lending that has occurred during the last decades, particularly since the advent of the EMU. It is a process that started before the implementation of the single currency and reflects the growing demand for credit provoked by the general downward trend of interest rates, above all in those countries where interest rates were rather high during the 1980s and the 1990s and were forced to converge to the levels of other EU countries.

Following these vectors of research, this paper seeks to contribute to the analysis of the European credit market and institutions during recent decades. The paper's main contributions are to be found in:

1) its study of the evolution of the European bank lending, using an adaptation of the Bernanke and Blinder (1988) model, which allows us to consider not only the macroeconomic conditions, but also to take into account the importance of the bank-performance conditions, here represented by four ratios: bank deposits/GDP; bonds and money market instruments/GDP; foreign assets/GDP; and foreign assets/foreign liabilities;
2) its use of panel estimates with quarterly data for all EU countries over a relatively long time period, from 1988 to 2006, in contrast with most of the studies in this area, which

focus mainly on the evolution of some more relevant countries in recent years, particularly since the advent of the EMU;

3) we also take into account the structural changes due not only to the EU's substantial enlargement, but also to the single market and the EMU, by comparing the results obtained for three panels of countries in different time periods:
    - A first panel with quarterly data, between Q1 1980 and Q3 2006 for 26 EU member-countries (Luxembourg is excluded, as it was not possible to obtain all the data for this country);
    - A second panel with the subset of quarterly data, for the time period Q1 1980-Q4 1998 and only for 11 "old" EU member-countries;
    - A third panel with another subset, now only with more recent quarterly data, (between Q1 1999 and Q3 2006) and again for all of the 26 EU countries, as indicated above.

The remainder of the paper is organised as follows: Section 2 presents the contextual setting and the relevant literature; the methodological framework and the data are presented in Section 3; Section 4 displays the results obtained; finally in Section 5, we make our concluding remarks.

2. Contextual Setting and Literature

The profound changes taking place in Europe reflect, on one hand, the remarkable enlargement of the EU since the 1980s and particularly during the last decade, which brought the simultaneous entry of ten countries in 2004, followed shortly after by two more countries. On the other hand, the adoption of the single currency and a common monetary policy have had a profound impact, not only in the Euro

area, but also throughout the entire EU-27, where the financial sector has experienced an increased integration and an intensification of competition in banking services.

Some authors have already analysed the degrees of integration through the common trends which may be identified in the context of the pressures of globalisation and which affect all the EU countries (not only the EMU members) with particular intensity, due to the process of disintermediation, new technologies and increased competition (Belaisch et al., 2001; Gardener et al., 2002; Melnik and Nissim, 2006; Romero-Ávila, 2007).

The increasingly competitive environment of the EU banking sector and the process of concentration, as well as the decline in the number of banks in almost all EU countries, did not eliminate much of the excess capacity in the system. Moreover, there is evidence that large banks may continue to have efficiency advantages over the smaller banks (Altunbas et al., 1997; Cabral et al., 2002; Casu and Molyneaux, 2000; Jansen and de Haan, 2003; Molyneaux, 2003; Baele et al., 2004; Romero-Ávila, 2007).

In Barros et al. (2007), the efficiency of almost 1400 commercial banks operating in the EU between 1993 and 2001 was analysed. The study confirmed the importance of country-level characteristics and firm-level features to explain the probability of a bank being a best (worst) performer. In particular, the findings pointed to the possibility that smaller-sized banks with higher loan intensity and foreign banks from countries upholding common law traditions have a higher probability of best performance.

It is generally recognised that nowadays, special attention must be paid to the EU banking sector following the most recent enlargements mentioned above, particularly regarding those countries under the former Soviet Union's sphere of influence, given that in a quite short period of time, the banks in these countries moved away from the socialist structure of banking, in which the financial organisations were used to support the central banking system, to a market economy and the concomitant decentralisation and liberalisation of the banking systems.

In most of these Eastern and Central European countries, forms and programmes were introduced to amend property rights, together with processes of privatisations of part of the State property. As a result, the importance of the private sector and firms increased in these countries, as did the particularly relevant role of their financial intermediaries and banking institutions. There is a fairly strong consensus on the increased performance and efficiency of the banks under the new market conditions in these countries. Several studies (Holscher, 2000; Hanousek and Kocenda, 2003; Stephen and Backhaus, 2003; Dimitrova, 2004; Bonin and Watchel, 2004; Bonin et al, 2005; Freis and Taci, 2005; Fries et al., 2006) confirm the relevant improvements in efficiency of the banking systems of the new EU members and the effects of ownership, concluding that foreign-owned banks are usually more cost-efficient.

Other studies examine how, and to what extent, the banking sectors of the new member-states have integrated with those of the older EU members and the process of nominal and real convergence of these countries to EU standards (ECB, 2004 and 2005; Kocenda et al., 2006).

The transmission of monetary policy to the non-monetary economic sectors also requires more efficient banking and the way that banks adapt lending in response to monetary policy decisions varies according to their specific political and economic environment. Some contributions analyse the transmission channels of monetary policy in different EU countries, including the new member-states in Central and Eastern Europe (Gambacorta and Mistrulli, 2004; Golinelli and Rovelli, 2005; Elbourne and de Haan, 2006; Ferreira, 2007, 2008). However, in spite of all the theoretical and empirical advances in this area, there is still no agreement about the precise specification of the ways in which monetary policy and credit lending influences the economy (Goddart et al. 2007).

According to the credit view, monetary policy decisions will affect not only the credit demand side, through the balance sheet channel, but also the supply side, through the bank lending channel. More precisely, for instance, the tightening of monetary policy, through the balance sheet channel will make external finance more costly for borrowers, with the increase of their interest expenses and the

reduction of their collateral while, through the bank lending channel, the reduction of the banks' liquidity will force banking institutions to reduce lending.

However, such a reduction also reflects the banks' characteristics and the environment in which banks are operating. Lending by smaller and relatively under-capitalised or illiquid banks is usually more sensitive to interest rate movements (Kashyap and Stein, 1997, 2000; Kishan and Opiela, 2006).

3. Methodological Framework and Data Used

3.1. The Model

In our analysis, we will use a version of the Bernanke and Blinder (1988) model, which we develop in Appendix I of this paper (with all the variables in natural logarithms).

Basically, in the money market, we will assume that money equals deposits held at banks by the non-monetary sectors. So, for the demand function, we assume that the nominal deposits held in banks by the private sector will depend on the GDP and the interest rate on bonds:

$$\mathrm{Dep}^{d} = \alpha_0 + \alpha_1 \ \mathrm{GDP} + \alpha_2 \ \mathrm{i}_{\mathrm{bonds}} \qquad (1)$$

where:

Dep^{d} = deposits, d meaning demand

GDP = Growth Domestic Product

$\mathrm{i}_{\mathrm{bonds}}$ = interest rate on bonds

Money supply will depend not only on the interest rate on bonds, but also on the influence of monetary policy (represented here by the relevant monetary policy interest rate, which is defined by the Central Bank):

$$\mathrm{Dep}^{s} = \beta_0 + \beta_1 \ \mathrm{i}_{\mathrm{bonds}} + \beta_2 \ \mathrm{i}_{\mathrm{mon.pol.}} \qquad (2)$$

now:

Dep^s = deposits, s meaning supply

i_{bonds} = interest rate on bonds

$i_{mon.pol.}$ = monetary policy interest rate

In the credit market, the demand for lending depends on the GDP, the interest rate on bonds and the interest rate on lending/borrowing:

$$Lend^d = \chi_0 + \chi_1 GDP + \chi_2 i_{lend} + \chi_3 i_{bonds} \quad (3)$$

where:

$Lend^d$ = lending, d meaning demand

GDP = Growth Domestic Product

i_{lend} = interest rate on lending

i_{bonds} = interest rate on bonds

Assuming the relevance of one or more bank-performance characteristics ($Char_x$) to lending, we may define the supply in the money market as depending on the deposits of the private sectors in banks, as well as on the bank characteristics, the interest rate on lending/borrowing and the interest rate on bonds:

$$Lend^s = \delta_0 + \delta_1 Dep + \delta_{2x} Car_x + \delta_3 i_{lend} + \delta_4 i_{bonds} \quad (4)$$

with:

$Lend^s$ = lending, s meaning supply

Dep = bank deposits of the private sector

Car_x = bank characteristics (x = 1,..X)

i_{lend} = interest rate on lending

i_{bonds} = interest rate on bonds

Clearing the money and credit markets leads to the reduced form of the model (see Appendix I for more details on calculations) and, more precisely, to the equation that will explain the bank-lending growth:

$$L = \varphi_0 + \varphi_1 \, GDP + \varphi_2 \, i_{mon.pol} + \varphi_{3x} \, Car_x \qquad (5)$$

where:

Lend = bank lending

GDP = Growth Domestic Product

$i_{mon.pol.}$ = monetary policy interest rate

Car_x = bank characteristics (x = 1,..X)

3.2. The Data

We use Eurostat and International Financial Statistics (IFS) quarterly data for EU countries during the time period from Q1 1999 to Q3 2006 and we build three panels:

1) A first panel with quarterly data, between Q1 1980 and Q3 2006 (107 quarters) for all 26 EU member states, amounting to 2782 observations. As mentioned previously, Luxembourg has been excluded, as it was not possible to collect all the necessary data for this country;

2) A second panel with a subset of this data (836 observations), for the time period between the beginning of the 1980s and the advent of the EMU (107 quarters, between Q1 1980 and Q4 1998) and only for 11 "old" EU member-countries: Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Portugal, Spain, Sweden and the U.K.;

3) A third panel with another subset, now only with more recent quarterly data, (31 quarters between Q1 1999 and Q3 2006) and again for all of the 26 EU countries, amounting to 806 observations.

For the dependent variable (bank lending), we use the natural logarithm of the ratio of the domestic credit provided by the banking institutions to GDP. To explain the growth of this bank lending, we will consider (always in natural logarithms):

- The real GDP per capita, representing the macroeconomic conditions of the different EU countries;
- The discount rate (end of the period), which is the monetary policy interest rate;
- The ratio deposits to GDP, that is, the total deposits in the banking institutions which are important sources of resources for credit lending. For instance, according to the macroeconomic money multiplier mechanism, bank lending will mainly depend on the collected deposits and the legal minimum reserves;
- The ratio of the bonds and money market instruments to GDP, as a proxy of the development of the financial markets in these countries, which are mostly bank-dominated. Since healthy financial markets and developed financial institutions are a guarantee for the direct and indirect financing of the bank clients' activities, we may expect that this ratio will exert a positive influence on bank activities and support bank lending;
- The ratio foreign assets to GDP, introducing the influence of the other countries, more specifically, the financial resources obtained from foreign partners, represented by the entry of assets, in particular to pay their debts and financial obligations and consequently, more resources to be applied in the domestic bank lending;
- The ratio foreign assets to foreign liabilities, representing the financial situation of the banking institutions towards other countries, as they may receive payments from foreign debtors. On the other hand, they also have financial obligations towards foreign creditors, which implies the payment of debts and obligations to other countries. Therefore, the influence of this ratio on bank lending will reveal not only the openness of the financial markets, but moreover, the degree of dependence on the other countries' financial resources.

In Appendix II, we present the summary statistics of these series, while the matrix of the correlations is reported in Appendix III.

3.3. Unit Root Tests

The number of observations of the collected data to build our three panels does not lend itself to the application of single time series unit root tests. Therefore, we opt to use panel unit root tests, which are more adequate in this case. These tests not only increase the power of unit root tests due to the span of the observations, but also minimise the risks of structural breaks due to deep changes during the considered time period.

From among the available panel unit root tests, we choose the Levin, Lin and Chu (2002) test, which may be viewed as a pooled Dickey-Fuller test or as an augmented Dickey-Fuller test when lags are included, the null hypothesis being the existence of non-stationarity. This test is adequate for heterogeneous panels of moderate sise, such as the present cases and it assumes that there is a common unit root process.

The results obtained are reported in Appendix III and clearly allow us to reject the existence of the null hypothesis for all the variables included in the three considered panels.

4. Empirical Estimations

Using the presented reduced form of the model (equation 5) and the series described above, we will analyse the evolution of bank lending and the relevant macroeconomic conditions, as well as to some specific characteristics of the banking institutions and indicators representing their performance conditions, by the estimation of the following equation (all variables in natural logarithms):

$$\textbf{(Bank Lending/GDP)}_{it} = \varphi_0 + \varphi_1 \textbf{ real GDP per cap.}_{it} + \varphi_2 \textbf{ Interest rate}_{it} + \varphi_3 \textbf{(Deposits/GDP)}_{it} + \varphi_4 \textbf{(Bonds and Money Market Instruments/GDP)}_{it} + \varphi_5 \textbf{(Foreign Assets/GDP)}_{it} + \varphi_6 \textbf{(Foreign Assets/Foreign Liabilities)}_{it} + \eta_i + \nu_t + u_{it}$$

Where:

$i = 1,..., N$ = number of EU countries included in each panel

$t = 1, T$ = number of the considered quarters

η_i = country dummies

ν_t = time (quarter) dummies

u_{it} = error term

Following Wooldridge (2002), in our estimations we opt to use a panel data approach which not only provides more observations for estimations, but also reduces the possibility of multi-colinearity among the different variables. With pooled total, ordinary least squares (OLS) robust estimates, we test the degree of integration, assuming a common intercept and a single set of slope coefficients for all the panel observations.

For each of the presented panels, we report (in Table 1) consistent results for the two estimated equations: a first that includes all the considered explaining variables and a second equation not including the ratio bonds and money market instruments to GDP, the variable that we used as a proxy of the development of the financial markets and which revealed a less homogenous behaviour.

(Take in Table 1)

The best results were obtained without any lagged variables[1], indicating the almost immediate reaction of bank lending growth to the real per-capita GDP growth, the monetary policy interest rate and the four bank-performance indicators and conditions included in our model.

The reported results reveal not only consistency, but also similar explanations of bank lending growth and almost all the presented variables in the EU countries during the considered time periods.

The only exception is the ratio of the bonds and money market instruments to GDP. According to the results obtained in our panel III we can conclude that, since the advent of the EMU, this ratio grew in line with bank credit as it also did in the past at least in the subset of 11 "old" EU countries included in our panel II. But this behaviour is not homogenous and we can not generalize the conclusions for the entire time period and all the EU countries included in our panel I.

On the other side, in all situations the ratio foreign assets to foreign liabilities has an opposite evolution of bank lending growth, revealing the high degree of foreign dependence and indebtedness of the EU financial systems during this period.

All the other explanatory variables grow in line with bank lending.

The similar evolution of the monetary policy interest rate and bank lending is not a surprise, in view of the fact that during this period, all of the central banks, and particularly the ECB after the advent of the single currency, maintained interest rates at historically low levels, thereby contributing to the growth of the ratio bank lending to GDP.

5. Concluding remarks

This paper confirms the high degree of integration among the EU financial systems, as well as the importance of bank-performance conditions to the bank credit in the EU countries during recent years.

[1] The results of the estimations including lagged variables are available from the author upon request.

We contribute to the existing empirical evidence by introducing into an adaptation of the Bernanke and Blinder (1988) model not only the real GDP per capita and the monetary policy interest rate, but also some specific variables representing the bank performance conditions, to explain bank lending to GDP, namely, the ratio bank deposits/GDP; the ratio bonds and money market instruments/GDP, the ratio foreign assets/GDP and the ratio foreign assets/foreign liabilities.

We compare the results obtained for three panels of EU countries during different time periods: a first panel with quarterly data between Q1 1980 and Q3 2006 for all 26 EU member-states (the only exclusion is Luxembourg, for which it was not possible to obtain all the data); a second panel with the subset of quarterly data for the time period Q1 1980-Q4 1998 and only for 11 "old" EU member-countries and finally a third panel with another subset, now only with more recent quarterly data, (between Q1 1999 and Q3 2006) and again for all the 26 EU countries.

The consistency of the results obtained, using pooled OLS robust panel estimations, allows us to conclude that the EU banking institutions have similar reactions to the variations of the macroeconomic conditions, in particular to the monetary policy interest rates as well as to the variations of the bank-performance conditions. The results also confirm the importance of these variables to bank lending growth (more precisely, the growth of the ratio of the domestic credit provided by the banking institutions to GDP) in the EU countries.

In all situations, the macroeconomic conditions, here represented by the real GDP per capita and the monetary policy interest rate, were favourable to bank lending growth.

Furthermore, the results obtained with the inclusion of bank-performance conditions allow us to state that:

- the growth of the ratio deposits to GDP increases in line with bank lending growth, confirming the intermediate role of financial institutions and the fact that the capacity to attract savings (in the form of deposits) is always a good condition in which to provide credit to those who need financing;

- the behaviour of the growth of the ratio bonds and money market instruments to GDP, which can be considered as a proxy of the development of the financial markets in the EU countries, is less homogeneous. Although at least for some EU countries the ratio did not always grow in line with bank credit, nowadays they increase in the same direction confirming not only of the fact that the EU financial markets continue to be bank-dominated, but also that the development of the financial systems is usually a good condition for the direct and indirect financing of bank clients' activities;
- as expected, the growth of the ratio foreign assets to GDP also exerts a positive influence on the bank lending growth, as the entry of foreign assets received from the other countries increases the resources to concede credit to the domestic banks' clients;
- the growth of the ratio foreign assets to foreign liabilities contributes negatively to the domestic bank lending growth, revealing not only the openness of the financial markets, but more importantly, their indebtedness and the dependence of the EU banking institutions on other countries' financial resources.

Finally, it is clear that the total credit provided by the EU banking institutions depends on the macro-economic conditions, and particularly on monetary-policy decisions. At the same time, bank lending is an essential transmission channel of monetary policy decisions, but it still depends on the performance conditions of the different financial institutions.

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APPENDIX I

With reference to the model presented in Section 3 of this paper, demand in the money market depends on real GDP and the interest rate on bonds, while supply depends on the interest rate on bonds, in addition to the interest rate established by monetary policy:

$$Dep^{d} = a_0 + a_1\ GDP + a_2\ i_{bonds} \qquad [1]$$

$$Dep^{s} = b_0 + b_1\ i_{bonds} + b_2\ i_{mon.pol.} \qquad [2]$$

Demand in the credit market depends on real GDP, the interest rate on lending and also on the interest rate on bonds.

Including another (or more) variable(s), which will capture the bank-specific performances, the credit supply will depend on the private-sector deposits at banks, the bank performance indicator(s), the interest rate on lending and also the interest rate on bonds.

$$Lend^{d} = c_0 + c_1\ GDP + c_2\ i_{lend} + c_3\ i_{bonds} \qquad [3]$$

$$Lend^{s} = d_0 + d_1\ Dep + d_2\ Car_x + d_3\ i_{lend} + d_4\ i_{bonds} \qquad [4]$$

Clearing the money market - equations [1] and [2] - we obtain:

$$i_{bonds} = \frac{b_0 - a_0}{a_2 - b_1} - \frac{a_1}{a_2 - b_1} GDP + \frac{b_2}{a_2 - b_1} i_{mon.pol}$$

or

$$i_{bonds} = e_0 + e_1\ GDP + e_2\ i_{mon.pol} \qquad [5]$$

and also:

$$Dep^{d} = Dep^{s} = \frac{a_2 b_0 - a_0 b_1}{a_2 - b_1} - \frac{a_1 b_1}{a_2 - b_1} GDP + \frac{a_2 b_2}{a_2 - b_1} i_{mon.pol}$$

or

$$Dep = f_0 + f_1\ GDP + f_2\ i_{mon.pol} \qquad [6]$$

Clearing the credit market - equations [3] and [4] - we first obtain the expression of the interest rate on lending:

$$i_{lend} = \frac{d_0 - c_0}{c_2 - d_3} + \frac{d_1}{c_2 - d_3} Dep + \frac{d_2}{c_2 - d_3} Car_x + \frac{d_4 - c_3}{c_2 - d_3} i_{bond} - \frac{c_1}{c_2 - d_3} GDP$$

or

$$i_{lend} = g_0 + g_1 Dep + g_2 Car_x + g_3 i_{bond} + g_4 GDP \qquad [7]$$

Using this expression, we then obtain for the credit market equilibrium:

$$Lend^d = Lend^s = \frac{c_2 d_0 - c_0 d_3}{c_2 - d_3} - \frac{c_1 d_3}{c_2 - d_3} GDP + \frac{c_2 d_4 - c_3 d_3}{c_2 - d_3} i_{bond} + \frac{c_2 d_1}{c_2 - d_3} Dep + \frac{c_2 d_2}{c_2 - d_3} Car_x$$

or

$$Lend = h_0 + h_1 GDP + h_2 i_{bond} + h_3 Dep + h_4 Car_x \qquad [8]$$

Bearing in mind the definitions obtained for the interest rate on bonds and deposits - equations [5] and [6]

$$i_{bonds} = e_0 + e_1 GDP + e_2 i_{mon.pol} \qquad [5]$$

$$Dep = f_0 + f_1 GDP + f_2 i_{mon.pol} \qquad [6]$$

and introducing these expressions into equation [8], we may obtain the reduced form of the expression for lending, which is the basis of our estimations:

$$L = \alpha_0 + \alpha_1 GDP + \alpha_2 i_{mon.pol} + \alpha_3 Car_x$$

where

$$\alpha_0 = h_0 + h_2 e_0 + h_3 f_0$$

$$\alpha_1 = h_1 + h_2 e_1 + h_3 f_1$$

$$\alpha_2 = h_2 e_2 + h_3 f_2$$

$$\alpha_3 = h_4$$

APPENDIX II – Summary Statistics

PANEL I

(26 EU countries, time period: Q1 1980 – Q4 2006)

VARIABLES (all in natural logarithms)	Mean	Std. Dev.	Min	Max	Observations
Bank Lending/GDP:					
overall	.8322505	.9774401	-3.238277	4.37402	N = 2782
between		.8238988	-1.006885	2.711879	i = 26
within		.5499574	-1.654911	2.822849	T = 107
Real GDP per capita:					
overall	3.860671	3.361557	0	14.86861	N = 2782
between		2.089688	1.222639	11.8036	i = 26
within		2.664528	-5.642677	9.536155	T = 107
Interest rate:					
overall	1.641378	.9839171	-.02703	5.70378	N = 2782
between		.4913641	.7124381	2.54158	i = 26
within					T = 107
Deposits/GDP:					
overall	.9377853	1.393441	-2.8031	6.04847	N = 2782
between		1.225855	-.8186155	5.689049	i = 26
within		.7044398	-1.70508	3.98621	T = 107
Bonds and Money Market Instruments/GDP:					
overall	-.3619342	1.555666	-11.48691	2.28638	N = 2782
between		1.006243	-2.545149	1.356671	i = 26
within		1.202566	-9.423457	4.357364	T = 107
Foreign Assets/GDP :					
overall	-.0500115	1.424475	-10.41371	4.39025	N = 2782
between		.9648011	-3.004784	2.049346	i = 26
within		1.064785	-7.458937	4.533285	T = 107
Foreign Assets/Foreign Liabilities :					
overall	-.1173586	.6475688	-2.84091	3.37763	N = 2782
between		.3903511	-1.053855	.7195766	i = 26
within		.5222826	-2.723352	3.178975	T = 107

PANEL II

(11 EU countries, time period: Q1 1980 - Q3 1998)

VARIABLES (all in natural logarithms)	Mean	Std. Dev.	Min	Max	Observations
Bank Lending/GDP:					
overall	1.22105	.3084573	.2578	1.8361	N = 836
between		.2339891	.7879128	1.485426	i = 11
within		.2128679	.3188967	1.816	T = 76
Real GDP per capita:					
overall	3.70062	1.593753	.92294	6.38221	N = 836
between		1.665629	1.132671	6.149226	i = 11
within		.122152	3.448473	4.035998	T = 76
Interest rate:					
overall	2.026948	.5582257	.69315	3.27911	N = 836
between		.3837639	1.503318	2.630425	i = 11
within		.4213899	.4951338	2.846154	T = 76
Deposits/GDP:					
overall	1.323948	1.376972	-.06464	5.66468	N = 836
between		1.422153	.5246633	5.563357	i = 11
within		.2349371	.4695954	1.918031	T = 76
Bonds and Money Market Instruments/GDP:					
overall	-.7647585	1.687273	-7.46515	1.61596	N = 836
between		1.591446	-4.393777	1.201519	i = 11
within		.735987	-3.836131	2.090602	T = 76
Foreign Assets/GDP :					
overall	.0386476	.9384367	-2.11716	4.39025	N = 836
between		.8521703	-.9882891	1.415759	i = 11
within		.4687178	-1.219723	5.287687	T = 76
Foreign Assets/Foreign Liabilities :					
overall	-.1118892	.3161619	-1.10687	.74724	N = 836
between		.27964	-.6545087	.3311328	i = 11
within		.1696575	-.8092806	.492927	T = 76

PANEL III

(26 EU countries, time period: Q1 1999 - Q3 2006)

VARIABLES (all in natural logarithms)	Mean	Std. Dev.	Min	Max	Observations
Bank Lending/GDP:					
overall	.9634145	1.106034	-3.238277	3.393542	N = 806
between		1.10247	-2.791807	3.356674	n = 26
within		.2305814	.0820281	3.11783	T = 31
Real GDP per capita:					
overall	6.051169	2.678176	1.349683	12.66796	N = 806
between		2.72726	1.443205	12.42524	n = 26
within		.108951	5.524112	6.514984	T = 31
Interest rate:					
overall	1.481935	.5696396	-.027029	3.555348	N = 806
between		.4792344	.7142627	3.069609	n = 26
within		.3215317	.4369591	2.581849	T = 31
Deposits/GDP:					
overall	1.295129	1.519575	-2.773942	6.048469	N = 806
between		1.528612	-2.488645	5.997196	n = 26
within		.2439945	-.3845825	1.981867	T = 31
Bonds and Money Market Instruments/GDP:					
overall	-.0795288	1.750138	-5.396411	2.286376	N = 806
between		1.695878	-3.744696	1.986972	n = 26
within		.5423645	-2.622679	1.495855	T = 31
Foreign Assets/GDP :					
overall	-.080594	2.21202	-10.41371	3.237338	N = 806
between		2.240099	-9.219169	2.771956	n = 26
within		.2489937	-1.275133	.6851328	T = 31
Foreign Assets/Foreign Liabilities :					
overall	-.0051241	.7618601	-2.477355	2.884752	N = 806
between		.6818788	-1.203865	2.3363	n = 26
within		.364417	-1.446608	2.090333	T = 31

APPENDIX III – Correlation Matrix

PANEL I

(26 EU countries, time period: Q1 1980 - Q3 2006)

	Real Lending / GDP	Real GDP per capita	Interest rate	Deposits / GDP	Bonds and Money Market Instruments/ GDP	Foreign Assets/ GDP	Foreign Assets/ Foreign Liabilities
Bank Lending/GDP	1.0000						
Real GDP per capita	0.2592	1.0000					
Interest rate	0.1433	0.3331	1.0000				
Deposits/ GDP	0.6040	0.0738	0.0493	1.0000			
Bonds and Money Market Instruments/GDP	0.2010	-0.2990	-0.2148	0.2165	1.0000		
Foreign Assets/GDP	0.5779	-0.1793	-0.2510	0.3670	0.4608	1.0000	
Foreign Assets/Foreign Liabilities	-0.0507	-0.0769	-0.2414	0.2098	0.0199	0.1583	1.0000

PANEL II

(11 EU countries, time period: Q1 1980 - Q3 1998)

	Real Lending / GDP	Real GDP per capita	Interest rate	Deposits / GDP	Bonds and Money Market Instruments/ GDP	Foreign Assets/ GDP	Foreign Assets/ Foreign Liabilities
Bank Lending/GDP	1.0000						
Real GDP per capita	0.0330	1.0000					
Interest rate	-0.2973	0.1712	1.0000				
Deposits/ GDP	0.4101	-0.2459	-0.3014	1.0000			
Bonds and Money Market Instruments/GDP	0.2394	-0.5918	-0.4002	0.1917	1.0000		
Foreign Assets/GDP	0.1102	-0.2590	-0.4383	-0.1663	0.5008	1.0000	
Foreign Assets/Foreign Liabilities	0.1892	-0.1148	-0.3647	0.4380	0.3535	0.3193	1.0000

PANEL III

(26 EU countries, time period: Q1 1999 - Q3 2006)

	Real Lending / GDP	Real GDP per capita	Interest rate	Deposits / GDP	Bonds and Money Market Instruments/ GDP	Foreign Assets/ GDP	Foreign Assets/ Foreign Liabilities
Bank Lending/GDP	1.0000						
Real GDP per capita	-0.1951	1.0000					
Interest rate	-0.4227	0.1853	1.0000				
Deposits/ GDP	0.7154	-0.1843	-0.3777	1.0000			
Bonds and Money Market Instruments/GDP	0.4828	-0.4132	-0.3314	0.4144	1.0000		
Foreign Assets/GDP	0.8005	-0.2019	-0.5605	0.6140	0.5878	1.0000	
Foreign Assets/Foreign Liabilities	0.2235	-0.1555	-0.2109	0.4341	0.1835	0.3939	1.0000

APPENDIX IV – Panel unit root tests – Levin-Lin-Chu

PANEL I

(26 EU countries, time period: Q1 1980 - Q3 2006)

VARIABLES	coefficients	t-value	t-star	P>t	N
Bank Lending/GDP	-0.06969	-9.557	-3.14460	0.0008	2650
Real GDP per capita	-0.00553	-2.569	-2.56682	0.0051	2650
Interest rate	-0.02185	-7.163	-7.15592	0.0000	2650
Deposits/GDP	-0.07016	-9.841	-2.06946	0.0193	2650
Bonds and Money Market Instruments/GDP	-0.00747	-2.350	-2.34752	0.0094	2650
Foreign Assets /GDP	-0.09831	-12.542	-5.90625	0.0000	2650
Foreign Assets/Foreign Liabilities	-0.02127	-5.500	-5.49457	0.0000	2650

PANEL II

(11 EU countries, time period: Q1 1980 - Q3 1998)

VARIABLES	coefficients	t-value	t-star	P>t	N
Bank Lending/GDP	-0.00809	-1.393	-1.38352	0.0833	750
Real GDP per capita	-0.59586	-17.469	-15.70921	0.0000	750
Interest rate	-0.02295	-3.201	-3.17881	0.0007	750
Deposits/GDP	-0.15426	-7.803	-2.74708	0.0030	750
Bonds and Money Market Instruments/GDP	-0.01034	-3.496	-3.47149	0.0003	750
Foreign Assets /GDP	-0.42727	-22.067	-19.26620	0.0000	750
Foreign Assets/Foreign Liabilities	-0.01434	-2.587	-2.56892	0.0051	750

PANEL III

(26 EU countries, time period: Q1 1999 - Q3 2006)

VARIABLES	coefficients	t-value	t-star	P>t	N
Bank Lending/GDP	-0.85254	-48.179	-43.23545	0.0000	750
Real GDP per capita	-1.01649	-28.060	-18.99290	0.0000	750
Interest rate	-0.04239	-6.549	-6.34443	0.0000	750
Deposits/GDP	-0.40333	-13.622	-5.38484	0.0000	750
Bonds and Money Market Instruments/GDP	-0.00984	-4.578	-4.42858	0.0000	750
Foreign Assets /GDP	-0.12876	-7.677	-2.75593	0.0029	750
Foreign Assets/Foreign Liabilities	-0.17329	-9.362	-1.78286	0.0373	750

Table 1 – Pooled OLS Robust Estimations (*)

PANEL I

(26 EU countries, time period: Q1 1980- Q3 2006)

	EQUATION I	EQUATION II
Real GDP per capita		
coef.	.0759668	.0781048
T-statistic	16.45	17.94
P-value	0.000	0.000
Interest rate		
coef.	.1215754	.1240972
T-statistic	9.07	9.16
P-value	0.000	0.000
Deposits/GDP		
coef.	.2969024	.2941063
T-statistic	21.86	21.71
P-value	0.000	0.000
Bonds and Money Market Instruments/GDP		
coef.	-.0207019	
T-statistic	-2.49	
P-value	0.013	
Foreign Assets/GDP		
coef.	.3726493	.3642184
T-statistic	36.98	38.09
P-value	0.000	0.000
Foreign Assets/Foreign Liabilities		
coef.	-.26435	-.2593609
T-statistic	-9.30	-9.21
P-value	0.000	0.000
constant		
coef.	.0411059	.0389916
T-statistic	2.38	2.25
P-value	0.017	0.024
	R-squared = 0.6570	R-squared = 0.6563
	F (6, 2775) = 854.07 Prob>F= 0.0000	F (5, 2776) = 1013.22 Prob>F=0.0000
	N = 2782	N = 2782

PANEL II

(11 EU countries, time period: Q1 1980 - Q3 1998)

	EQUATION I	EQUATION II
Real GDP per capita		
coef.	.063581	.033739
T-statistic	8.58	5.52
P-value	0.000	0.000
Interest rate		
coef.	.0763293	.0372257
T-statistic	2.70	1.29
P-value	0.007	0.198
Deposits/GDP		
coef.	.1248954	.1225994
T-statistic	14.06	14.70
P-value	0.000	0.000
Bonds and Money Market Instruments/GDP		
coef.	.0581144	
T-statistic	5.72	
P-value	0.000	
Foreign Assets/GDP		
coef.	.0461512	.0694157
T-statistic	3.24	4.98
P-value	0.001	0.000
Foreign Assets/Foreign Liabilities		
coef.	-.1694083	-.1159745
T-statistic	-3.83	-2.54
P-value	0.000	0.011
constant		
coef.	.4582903	.6029935
T-statistic	3.69	5.06
P-value	0.000	0.000
	R-squared = 0.3799	R-squared = 0.3347
	F (81, 754) = 7.65 Prob>F = 0.0000	F (80, 755) = 8.04 Prob>F= 0.0000
	N = 836	N = 836

PANEL III

(26 EU countries, time period: Q1 1999 - Q3 2006)

	EQUATION I	EQUATION II
Real GDP per capita		
coef.	.2623998	.4189429
T-statistic	3.29	4.79
P-value	0.001	0.000
Interest rate		
coef.	.0426578	.0868218
T-statistic	1.77	3.18
P-value	0.078	0.002
Deposits/GDP		
coef.	.2303884	.3419657
T-statistic	4.50	4.90
P-value	0.000	0.000
Bonds and Money Market Instruments/GDP		
coef.	.1589014	
T-statistic	7.77	
P-value	0.000	
Foreign Assets/GDP		
coef.	.2198304	.2526167
T-statistic	7.25	7.92
P-value	0.000	0.000
Foreign Assets/Foreign Liabilities		
coef.	-.1545319	-.2124955
T-statistic	-6.36	-8.62
P-value	0.000	0.000
constant		
coef.	-.4096939	-1.143916
T-statistic	-1.11	-2.87
P-value	0.268	0.004
	R-squared = 0.9760	R-squared = 0.9711
	F (31, 774) = 3158.20 Prob > F= 0.0000	F (30, 775) = 2901.07 Prob>F= 0.0000
	N = 806	N = 806

(*) Time and country dummies were included in the estimations and the obtained results are available from the author upon request.